

1/2 033 UNCLASSIFIED PROCESSING DATE--13NOV70
TITLE--FRICTION AND WEAR OF ANTIFRICTION COMPOSITION MATERIALS BASED ON
TEFLON 4 WITH LEAD -U-
AUTHOR--(02)-ISTOMIN, N.P., MATVEYEVSKIY, R.M.
COUNTRY OF INFO--USSR I
SOURCE--MOSCOW, VESTNIK MASHINOSTROYENIYA, NO 2, 1970, PP 47-50
DATE PUBLISHED-----70
SUBJECT AREAS--MATERIALS
TOPIC TAGS--ANTIFRICTION MATERIAL, LEAD, TEFLON, METAL CONTAINING POLYMER,
WEAR RESISTANCE
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FAME--3003/1869 STEP NO--UR/0122/70/000/002/0047/0050
CIRC ACCESSION NO--AP0130696
UNCLASSIFIED

2/2 033 UNCLASSIFIED PROCESSING DATE--13NOV70
CIRC ACCESSION NO--AP0130696
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. IT IS SHOWN THAT THE ADDITION OF
LOW DISPERSION LEAD TO ANTIFRICTION COMPOSITION MATERIALS BASED ON
TEFLON 4 DECREASES THE COEFFICIENT OF FRICTION AND SIGNIFICANTLY
INCREASES THEIR WEAR RESISTANCE.

UNCLASSIFIED

USSR

UDC 621.396.09:621.372.9-(068.8)

ISTOMIN, S. N., Institute of Electronic Machine Building

"A Device for Tuning the Frequency of the String-Resonators in an Electromechanical Filter"

USSR Author's Certificate No 255426, Filed 27 May 68, Published 27 Mar 70 (from RZh-Radiotekhnika, No 10, Oct 70, Abstract No 10V385 P)

Translation: This Author's Certificate introduces a device for tuning the frequency of the string-resonators in an electromechanical filter. The device contains a unit for adjusting the tension on the strings. As a distinguishing feature of the patent, the device is designed for simultaneously tightening all strings in the filter and achieving identical frequency characteristics. The device is made in the form of a system of rollers arranged in two rows. The string passes over these rollers, one end being securely fastened while the other end is fastened to the above-mentioned string tension regulator, which is connected to a drive mechanism.

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USSR

UDC 621.762.002.5(088.8)

ARON, P. M., YANNITSKIY, E. L., KUMMING, S. YA., and ISTOMIN, V. A.

"Apparatus for Treatment of Powdered Materials"

Ussr Authors' Certificate No 259690, Cl. 81e, 11; 21g 31/03. (B 65 j, H 01 F),
filed 26 Aug 68, published 2 Jun 70 (from Metallurgiya, No 3, Mar 71,
Abstract No 33472 by O. Padalko)

Translation: The initial charge for thermochemical production of ferrite powder is delivered from a hopper onto a rotating disk and travels on it to the reaction chamber. An ignition device in the chamber submerges into the charge layer and ignites it. When the combustion front goes beyond the confines of the chamber, the drive switches on, and a new charge batch moves into the chamber. Removal of the powder leaving the chamber is effected by a scraper.

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USSR

ISTOMIN, Ya. N., and KARPMAN, V. I., Institute of Terrestrial Magnetism, the Ionosphere, and Radiowave Propagation, Academy of Sciences USSR

"Nonlinear Modulation of Quasimonochromatic Whistler Packet In Magnetosphere"

Moscow, Pis'ma v Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, Vol 15, No 4, 20 Feb 72, pp 208-211

Abstract: Much research has been done in the last few years on the propagation of monochromatic whistlers along the geomagnetic field in the upper ionosphere and magnetosphere, including experiments in which waves are radiated by a transmitter on earth and recorded by a receiver located at a magnetconjugate point. The transmitter usually radiates quasimonochromatic wave packets. The present article discusses some nonlinear effects due to the limited nature of a packet entering the active region of the magnetosphere.

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Aluminum and Its Alloys

USSR

UDC 669.715

ISTOMIN-KASTROVSKIY, V.V., NOVIKOV, I.I., and ZOLOTCEVSKIY, V.S., All-Union
Institute of Light Alloys; Moscow Institute of Steel and Alloys

"Substructure of Cast Alloys on an Aluminum-Magnesium Base"

Sverdlovsk, Fizika Metallov i Metallovedeniye, Vol 32, No 2, pp 442-445

Abstract: Cast aluminum alloys with 6.5 and 10% Mg produced from pure Al (99.99%) and pure Mg (99.92%) and from industrial alloys AMr6 (6% Mg, 0.7% Mn) and Al27-1 (10.5% Mg and 0.1% Be, Ti, and Zr) were experimentally investigated by the method of diffractational electron-microscopy. It was found that in the substructure of alloys on the Al - Mg base each dendritic cell represents a combination of subgrains. In proportion to the withdrawal from dendritic cell boundaries, the subgrain sizes increase and the dislocation density inside the subgrains has a tendency to decrease. The observed substructural characteristics of cast Al - Mg alloys are interpreted. Two illustr., five biblio. refs.

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1/2 Q20 UNCLASSIFIED PROCESSING DATE--04DEC70
TITLE--KINETICS OF ACCUMULATION AND TISSUE DOSES OF TRITIUM OXIDE
CHRONICALLY ADMINISTERED TO RATS -U-
AUTHOR--(02)-ISTOMINA, A.G., MOSKALEV, YU.I.
COUNTRY OF INFO--USSR
SOURCE--RADIOBIOLOGIYA 1970, 10(2), 310
DATE PUBLISHED-----70
SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES
TOPIC TAGS--TRITIUM OXIDE, RAT, RADIOACTIVE ISOTOPE, RADIATION DOSIMETRY
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY FICHE NO----FD70/605004/B10 STEP NO--UR/0205/70/010/002/0310/0310
CIRC ACCESSION NO--AP0139604
UNCLASSIFIED

PROCESSING DATE--0408070

UNCLASSIFIED

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CIRC ACCESSION NO--AP0139604

ABSTRACT/EXTRACT--(U) GP-0-

ABSTRACT. KINETICS OF ACCUMULATION OF PRIME3

H AND TISSUE DOSES WERE STUDIED IN RATS AFTER CHRONIC ADMINISTRATION OF

PRIME3 H SUB2 O IN DOSES OF 1.4 TIMES 10 PRIME5 NEGATIVE, 2.8 TIMES 10

PRIME6 NEGATIVE, AND 7 TIMES 10 PRIME7 NEGATIVE CI-G-DAY FOR 64 DAYS.

PRIME3 H CONTENT WAS DETD. IN URINE AND TISSUE FLUID AND IN DRY MATTER

OF 13 RAT TISSUES. AN EQUIL. WAS FOUND AFTER 20 DAYS. TOTAL TISSUE

DOSE D (IN RADS) ABSORBED BY A RAT DURING CHRONIC ADMINISTRATION OF

PRIME3 H SUB2 O MAY BE CALCD. FROM THE EQUATION $D = 9.5 \times 10$

PRIME5 (T-7)A SUBO (T IS GREATER THAN 20), WHERE T EQUALS PERIOD OF

H SUB2 O ADMINISTERED (IN DAYS), A SUBO EQUALS THE ACTIVITY OF PRIME3

RECEIVED BY A RAT AFTER THE INTERRUPTION OF THE RADIOISOTOPE

ADMINISTRATION IS $D = 8 \times 10$ PRIME6 SUBAO. FACILITY:

INST. BIOFIZ., MOSCOW, USSR.

UNCLASSIFIED

USSR

ISTOMINA, L. I.

"A Circular Plane of Order 5"

Kombinator. Analiz. [Combinatorial Analysis -- Collection of Works], No 2, Moscow, 1972, pp 73-85 (Translated from Referativnyy Zhurnal Kibernetika, No 6, 1973, Abstract No 6V348, by Ye. Gonin).

Translation: The uniqueness of a circular plane of order 5 is proven with accuracy to isomorphism. First, an example is constructed by introduction of Euclidean metrics to a projective plane of order 5 and seeking out all circles. Affine transforms are used to produce all ellipses passing through a fixed pair of points, and all full bundles of such ellipses are found with accuracy to isomorphism. The bundles for other pairs of points are found by affine transforms. Matching of bundles leads to the plane taken as an example. The selection of bundles was simplified in another work by the author (RZhMat, 1972, 7V274). Somewhat later than the article abstracted, another article was published by Denniston (RZhMat, 1973, 5V444) with the same results, produced by listing using another plan.

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1/3 042 UNCLASSIFIED PROCESSING DATE--20NOV70
TITLE--SPATIAL STRUCTURE OF THE EARTH'S BRIGHTNESS FIELD FROM KOSMOS 149
SATELLITE MEASUREMENTS -U-
AUTHOR--(03)-ISTOMINA, L.G., MALKEVICH, M.S., SYACHINOV, V.I.
COUNTRY OF INFO--USSR I
SOURCE--MOSCOW, IZVESTIYA AKADEMII NAUK SSSR, FIZIKA ATMOSFERY I OKEANA,
VOL VI, NO 5, 1970, PP 468-476
DATE PUBLISHED-----70

SUBJECT AREAS--ATMOSPHERIC SCIENCES, MATHEMATICAL SCIENCES, SPACE
TECHNOLOGY
TOPIC TAGS--ARTIFICIAL EARTH SATELLITE, OPTIC BRIGHTNESS, EARTH PLANET,
AUTOCORRELATION FUNCTION, EIGENVECTOR, CLOUD COVER, METEOROLOGY,
PARAMETER, MEASUREMENT/(U)COSMOS 149 SATELLITE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3005/0520

STEP NO--UR/0362/70/006/005/0468/0476

CIRC ACCESSION NO--AP0132717

UNCLASSIFIED

2/3 042

UNCLASSIFIED

PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AP0132717

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THIS PAPER GIVES SOME RESULTS OF A STUDY OF THE SPATIAL STRUCTURE OF THE EARTH'S BRIGHTNESS FIELD ON THE BASIS OF MEASUREMENTS OF REFLECTED SOLAR RADIATION MADE FROM THE "KOSMOS-149" ARTIFICIAL EARTH SATELLITE. OBSERVATIONS WERE MADE WITH SCANNING TELEPHOTOMETERS IN THE SPECTRAL INTERVAL 0.74 MICRON. IT WAS FOUND THAT IN EVALUATING THE DEGREE OF HOMOGENEITY AND ISOTROPY OF TWO DIMENSIONAL RANDOM FUNCTIONS IT IS NECESSARY TO FORMULATE A SYSTEM OF EMPIRICAL ORTHOGONAL VECTORS OF AUTOCORRELATION MATRICES OBTAINED FROM DISCRETE CROSS SECTIONS OF THE RANDOM FIELD IN SELECTED DIRECTIONS (FOR EXAMPLE, MUTUALLY PERPENDICULAR). IN THE CASE OF FIELD HOMOGENEITY THE FIRST EIGENVECTORS ARE CLOSE TO TRIGONOMETRIC FUNCTIONS AND THEIR FORM IS NOT DEPENDENT ON THE DIRECTIONS OF THE CROSS SECTION, BUT THE EIGENVALUES OF THE CORRELATION MATRICES FROM A HARMONIC SPECTRUM. IN THE CASE OF AN APPRECIABLE FIELD INHOMOGENEITY, WHEN IT IS IMPOSSIBLE TO USE THE CHARACTERISTICS OF HOMOGENEOUS RANDOM FUNCTIONS IN THE ANALYSIS, THE EIGENVALUES CAN BE REGARDED AS A GENERALIZATION OF SPECTRAL DENSITY AND EIGENVECTORS OF THE CORRESPONDING CORRELATION MATRICES CAN BE USED AS A CANONICAL SYSTEM. THE METHOD DESCRIBED IN THE STUDY MAKES IT POSSIBLE TO DETERMINE THE VALUE OF THE NATURAL SCALE OF RANDOM BRIGHTNESS FIELDS WHICH CAN BE CONSIDERED HOMOGENEOUS IN THIS SENSE (IN THIS CASE THIS VALUE IS 500 KM). WITH A DECREASE IN THE SCALE THE HOMOGENEITY PROPERTY IS EVIDENTLY NOT RETAINED UP TO THE SCALES OF SEVERAL KILOMETERS.

UNCLASSIFIED

3/3 042

UNCLASSIFIED

PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AP0132717

ABSTRACT/EXTRACT--SINCE VARIATIONS OF THE EARTH'S BRIGHTNESS ARE RELATED FOR THE MOST PART TO THE CLOUD COVER DISTRIBUTION AND THE LATTER IS RELATED TO THE SPATIAL FIELDS OF TEMPERATURE AND HUMIDITY IT IS OBVIOUSLY NECESSARY TO CONDUCT STATISTICAL PROCESSING OF THE FIELDS OF METEOROLOGICAL PARAMETERS AT DIFFERENT SCALES EMPLOYING THE METHOD DESCRIBED ABOVE. FACILITY: INSTITUTE OF ATMOSPHERIC PHYSICS.

UNCLASSIFIED

Burn Studies

USSR

IVANOVA, N. P.; YEVDOKIMOV, Ye. A.; SHEKHTER, A. B.; ~~ISTRANOV, L. P.~~; RUDEMKO, T. G.; SYCHENIKOV, I. A.; Central Scientific Research Laboratory imeni S. I. Chechulin, First Moscow Medical Institute imeni I. M. Sechenov, and Central Institute of Traumatology and Orthopedics.

"Application of Collagen Sponge in the Treatment of Burns"

Moscow, Novoye v Diagnostike, Lechenii, Profilaktike Vazhneyshikh Zabolevaniy i Metodakh Issledovaniya (News in Diagnosis, Treatment, and Prophylaxis of the Most Important Diseases and Methods of Investigation), Ministerstvo Zdravookhraneniya SSSR, 1971, 128 pp, pp 51-52

Abstract: Notwithstanding the large variety of materials and drugs used for the dressing and treatment of burns, to this date there is no generally accepted method of treatment. During the past few years information has appeared concerning the extensive utilization of collagen polymer preparations for the treatment of burns, trophic ulcers, scalp wounds, and so on,

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USSR

IVANOVA, N. P., et al, Novoye v Diagnostike, Lechenii, Profilaktike Vazhneyshikh Zabolevaniy i Metodakh Issledovaniya, 1971, 128 pp, pp 51-52

which is absorbed by the organism and has a positive effect on the regenerative processes of the lesion.

The porous collagen sponges are hemostatically effective, and by their hygroscopic and structural properties securely protect the injured surface from the effects of the external environment, considerably reduce plasma loss, and contribute to the growth of granulation tissue and the rapid healing of the lesions. In addition, the collagen can be permeated with different medicinal substances (antibiotics, antiseptics, hormones, vitamins, substances stimulating the growth of connective tissue, and others) which are released by lysis of the collagen sponge.

Taking into consideration the positive properties of the collagen preparation, researchers at the Central Scientific Research Institute of Traumatology and Orthopedics Burn Section applied

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USSR

IVANOVA, N. P., et al, Novoye v Diagnostike, Lechenii, Profilaktike Vazhneyshikh Zabolevaniy i Metodakh Issledovaniya, 1971, 128 pp, pp 51-52

a collagen sponge 0.5-0.8 cm thick and filled with boric acid, hydrocortisone, and furacillin to 20 patients with fresh burns and large granulation surfaces.

For the treatment of second and third degree burns, sponges corresponding in size to the injured areas were placed on the processed burned surfaces. Aseptic dressings were then applied. The dressings were changed within 2-3 days, and subsequently as required by the condition of the burned surface and the rapidity of lysis of the sponges. When applied to moist wound surfaces, the collagen sponges closely adhered to the wound, absorbing the lesion exudate. When exudation was copious, the sponges were absorbed by the second or third days.

The positive aspects of the application of collagen sponge are its rapid and painless covering of the burned surfaces, and the possibility of permeating the sponge with different medicinal substances which are able to exert a direct local effect on the

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USSR

IVANOVA, N. P., et al, Novoye v Diagnostike. Lechenii, Profilaktike Vazhneyshikh Zabolevaniy i Metodakh Issledovaniya, 1971, 128 pp, pp 51-52

wound with lysis of the sponge. Collagen sponges can be recommended for use in the general set of therapeutic measures for the treatment of patients with burns as a temporary dressing for the preparation of large injured surfaces for subsequent autoplasty.

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USSR

UDC 536.46:533.6

GREMYACHKIN, V. M., ISTRATOV, A. G.

"On the Stability of a Plane Flame in a Flow With a Velocity Gradient"

V sb. Goreniye i vzryv (Combustion and Explosion -- Collection of Works),
Moscow, "Nauka", 1972, pp 305-308 (from RZh-Mekhanika, No 3, Mar 73, Abstract
No 3B958)

Translation: The problem of the plane front of a flame under conditions when the velocity component of the flow tangential to the front rises linearly along the front considering the differences in the diffusion coefficients D and the temperature conductivity κ is discussed. The stability of the stationary reactions to curvature of the front is investigated. It is shown that for $D < \kappa$ extinguishing of the flame is possible for an increase in the gradient of the tangential flow velocity and for $D > \kappa$ the instability of the front toward the curvature is shown.

USSR

UDC 536.46

ASSOVSKIY, I. G., ISTRATOV, A. G., LIBROVICH, V. B., Moscow

"Necessary Conditions for Gradual Changes in Combustion Rates of Condensed Systems"

Zhurnal Prikladnoy Mekhaniki i Tekhnicheskoy Fiziki, No 6, 1971, pp. 57-64.

ABSTRACT: The ordinary statement of the problem for the theory of the combustion of condensed systems consists in that the combustion rate u must be determined on the basis of fixed external actions on the system (pressure p , light flux q , erosion gas flow rate g , etc.). The solution of this problem (the direct problem) must be interpreted as determination of sufficient conditions for achievement of a fixed change in combustion rate. Along with the direct problem, there is interest in the reverse problem: determination of conditions necessary to achieve a fixed rate of change of combustion with time $u(t)$. In this work, using the combustion model of Ye. B. Zel'dovich, a precise solution is achieved to the reverse problem in the case when the change in combustion rate u with time t is fixed as a stepped change in rate from stable quantity u_0 where $t < t_0$ to stable quantity u_1 where $t > t_0$.

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USSR

UDC 669.715.004.82

ISTRIN, M. A., and FISHER, A. YA.

"The Basic Directions in the Development of the Secondary Aluminum Industry
(Continuation of the Discussion)"

Moscow, Tsvetnyye Metally, No 2, Feb 71, pp 58-62

Translation: The following problems are considered in the article: the preparation of ore for smelting, the technique of smelting of secondary aluminum alloys, the assortment and quality of alloys, and the organizational structure of the secondary aluminum industry.

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USSR

UDC 621.316.722.1(088.8)

ISTUKHAYEV, V.A., MEL'NIKOVA, N.N.

"Voltage And Current Regulator"

USSR Author's Certificate No 265968, filed 6 June 68, published 1 July 70 (from RZh--Elektronika i yeye primeneniye, No 1, January 1971, Abstract No 13469P)

Translation: A circuit is proposed for a voltage and current regulator in which the transition from a regime of current regulation to a regime of voltage regulation is accomplished automatically. In order to assure small inertia during transition from regime to regime, in the regulator a supplementary comparator circuit is used which measures the load current, the signal from which is fed across a semiconductor diode to the input of the comparator circuit of the voltage regulator, where a signal is fed (also across a semiconductor diode) proportional to the output voltage of the regulator. If the signal proportional to the output voltage is larger than the signal from the output of the comparator circuit of the current regulator, then the semiconductor diode of the current regulator cuts off, and the comparator circuit of the voltage regulator controls the common regulating element of the regulator which assures voltage regulation.

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USSR

ISTYUFEYEV, V. A., MEL'NIKOVA, N. N., USSR Author's Certificate No 265968
(from ~~RZh~~-Elektronika i yeye primeneniye, No 1, Jan 1971, Abstract No 1B469P)

If the signal proportional to the current is larger than the voltage signal then the semiconductor diode of the voltage regulator is blocked and the comparator circuit of the voltage regulator controlling the regulating element maintains a constant load current for the regulator. 1 ill. S. D.

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1/2 017 UNCLASSIFIED PROCESSING DATE--30OCT70
TITLE--DESIGN OF AN OPERATIONAL AMPLIFIER -U-
AUTHOR--ISTYUFEEV, V.A.
COUNTRY OF INFO--USSR
SOURCE--MOSCOW, RADIOTEKHNIKA, NO 1, 1970, PP 99-100
DATE PUBLISHED-----70

SUBJECT AREAS--ELECTRONICS AND ELECTRICAL ENGR.
TOPIC TAGS--ELECTRONIC AMPLIFIER, ELECTRIC RESISTANCE, CIRCUIT DESIGN

CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAE--1999/1473 STEP NO--UR/0108/70/000/001/0099/0100
CIRC ACCESSION NO--AP0123376
UNCLASSIFIED

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UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0123376

ABSTRACT/EXTRACT--(U) GP-C- ABSTRACT. RELATIONSHIPS ARE DERIVED FOR
CALCULATING THE ELECTRIC PARAMETERS OF AN OPERATIONAL AMPLIFIER. THE
EFFECT OF THE INPUT AND OUTPUT RESISTANCE AND LOAD IS CONSIDERED.

UNCLASSIFIED

USSR

ISLPOV, F. G., and TERNOVAYA, L. P., Ufa Scientific Research Institute of
Vaccines and Sera imeni I. I. Mechnikov

"Dynamics of Antibody Titers to Nucleoprotein Antigen in Persons Repeatedly
Vaccinated With Live Influenza Vaccine"

Moscow, Voprosy Virusologii, No 4, Jul/Aug 71, p 492

Translation: A series of tests with sera from persons repeatedly vaccinated with live vaccines containing both nucleoprotein and hemagglutinating antigens of types A and B influenza viruses revealed that although the average titers to all four antigens increased with increasing number of inoculations, there was no correlation between the concentration of antibodies against hemagglutinating antigens and the concentration of antibodies against nucleoprotein antigens. On the basis of these findings it is recommended that both antigens be used simultaneously to evaluate the immunogenic properties of live influenza vaccines and to assess the results of seroconversion in human beings who have recovered from influenza.

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USSR

UDC 621.315.612.5

KARGOPOLOVA, N. P., POPLAVKO, Yu. M., ISUPOV, V. A.

"Investigation of the Anisotropy of a Piezoelectric Ceramic"

Vestn. Kiyev. politekhn. in-ta. Ser. radioelektron. (Kiev Polytechnical Institute Herald. Radio Electronic Series), 1971, No 8, pp 15-17 (from RZh-Radiotekhnika, No 12, Dec 71, Abstract No 12V646)

Translation: A study is made of the tensor of permittivity ϵ of polarized piezoelectric ceramic materials of various compositions. The anisotropy of ϵ was measured on frequencies of 1 kHz and 27.3 GHz. As was to be expected, anisotropy of ϵ at 1 kHz was observed for all investigated compositions of the ceramic. On superhigh frequencies, ϵ does not retain its anisotropy in all materials. The results are explained by means of notions of the movement of domain boundaries in an electric field. Résumé.

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1/2 021 UNCLASSIFIED PROCESSING DATE--27NOV70
TITLE--DIELECTRIC POLARIZATION OF SOLID SOLUTIONS BASED ON LEAD TITANATE
AND LEAD ZIRCONATE -U-
AUTHOR--ISUPOV, V. A. I

COUNTRY OF INFO--USSR

SOURCE--FIZ. TVERD. TELA 1970, 12(5), 1380-5

DATE PUBLISHED-----70

SUBJECT AREAS--MATERIALS, PHYSICS

TOPIC TAGS--DIELECTRIC POLARIZATION, SOLID SOLUTION, LEAD, TITANATE,
ZIRCONATE, THERMODYNAMIC ANALYSIS

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3003/1825

STEP NO--UR/0181/70/012/005/1380/1385

CIRC ACCESSION NO--AP0130655

UNCLASSIFIED

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UNCLASSIFIED

PROCESSING DATE--27NOV70

CIRC ACCESSION NO--AP0130655

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THERMODYNAMIC CONDITIONS WERE EXAMD. FOR THE EXISTENCE OF A MORPHOTROPIC PHASE BOUNDARY (THE EXISTENCE ON THE PHASE DIAGRAM OF VERTICAL OR ALMOST VERTICAL BOUNDARIES) IN SOLID SOLNS. BASED ON $PbTiO_3$ SUB3 AND $PbZrO_3$ SUB3. THE CONDITION FOR THE EXISTENCE OF THIS BOUNDARY CAN BE THE DEPENDENCE OF THE COEFF. β_{SUB2} OF THE TERM $(P_{SUBX}^2 + P_{SUBY}^2 + P_{SUBZ}^2)$ IN THE EXPANSION OF THERMODYNAMIC POTENTIAL AS A FUNCTION OF THE CONC. OF THE COMPONENTS, X, LEADING TO A CHANGE IN THE SIGN OF β_{SUB2} . THE MAX. IN THE DIELEC. CONST. NOTED AT THE ABOVE BOUNDARY WHEN X CHANGES IS EXPLAINED BY THE DEPENDENCES OF β_{SUB2} AND SPONTANEOUS POLARIZATION, P_{SUB0} , ON X. THE DEPENDENCES OF P_{SUB0} AND ORIENTATION POLARIZATION ON X ARE DISCUSSED. CALCD. DEPENDENCES ARE COMPARED WITH EXPTL. AN IMPORTANT CONTRIBUTION TO THE DIELEC. CONST. OF SOLID SOLNS. CLOSE TO THE MORPHOTROPIC PHASE BOUNDARY, OSCILLATING BETWEEN TETRAGONAL AND RHOMBEHEDRAL REGIONS, EXISTING IN THE GRAINS OF THIS CERAMIC, WAS NOTED.

FACILITY: INST. POLUPROV., LENINGRAD, USSR.

UNCLASSIFIED

USSR

UDC 669.18:621.746

SOBKIN, S. I., NCSOV, V. A., ISUPOV, V. F., BREUS, V. M., CHEPURNOVA, A. A., GROMOV, G. P., and ISMANOVA, T. A.

"Certain Factors Influencing the Increase in Density and Purity of Boiler Steel Ingots"

Proizvodstvo Chernykh Metallov (Production of Ferrous Metals--- Collection of Works), no 75, Metallurgiya Press, 1970, pp 240-251

Translation: A study is made of four ingots melted by the scrap process, the scrap ore process, and from a high-carbon semi-finished product of 100% cast iron with synthetic slag treatment of the semi-finished product and steel, cast under a layer of slag with heating of the riser of the ingot by lungerite or an exothermic mixture and lungerite in combination with heat insulation of the mold with asbestos.

The influence of these factors on the segregation of chemical elements, gas content, content of nonmetallic inclusions, density and dendritic structure of the ingot is established. 8 figures; 2 biblio. refs.

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USSR

GUBIN, V. Ye., ISUPOV, Yu. G., ORESHINA, M. D., KHAZIYEV, N. N., SHEMYAKINA, G. N.

"Free Convection in a Horizontal Cylinder"

Tr. VNII po Sboru, Podgotovke i Transp. Nefti i Nefteproduktov [Works of All-Union Scientific Research Institute on the Collection, Preparation and Transportation of Oil and Petroleum Products], No 8, 1971, pp 104-116, (Translated from Referativnyy Zhurnal, Mekhanika, No 4, 1972, Abstract No 4 B647 by Ye. M. Zhukhovitskiy).

Translation: Free, unstable convection in an infinite horizontal circular cylinder is studied. The wall temperature of the cylinder is maintained constant and differs from the temperature of the fluid. The temperature difference and size of the cavity are assumed sufficiently great that convection occurs in the boundary-layer mode. The problem is solved on the assumption of quasistability of the process: it is considered that the structure of the flow is determined at a given moment in time by the instantaneous temperature difference between the walls and the fluid and is independent of the rate of change of temperature with time.

The equations for planar, stable convective motion in the boundary layer approximation are solved by the Karman-Polhausen method. Laminar and turbulent

USSR

GUBIN, V. Ye., ISUPOV, Yu. G., ORESHINA, M. D., KHAZIYEV, N. N., SHEMYAKINA, G. N., Tr. VNII po Sboru, Podgotovke i Transp. Nefti i Nefteproduktov, No 8, 1971, pp 104-116.

lent flow modes are studied. The velocity and temperature are approximated by polynomials. The Reynolds analogy is used in the turbulent case. The solution of the nonlinear systems of equations for the velocity and thickness of the boundary layer is produced by the method of power series using a longitudinal coordinate. Furthermore, an analytic solution in the area of large Prandtl numbers is found in the laminar case. The boundary layer characteristics and heat flow through the surface of the cylinder are calculated.

Results are presented from an experimental study performed using two models with diameters of 30.5 and 97.5 cm and lengths of 15 and 27 cm respectively. The working fluids were gasoline and distilled water. Processing of the experimental data produced on heat transfer produces the dependence $N = 0.340 (GP)^{0.25}$ in the laminar case and $N = 0.092 (GP)^{0.40}$ in the turbulent case (Nusselt number N and Grashoff number G defined through diameter of cylinder and temperature difference between wall and fluid; P is the Prandtl number). Heating time of the fluid is estimated.

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USSR

UDC 678.85.03

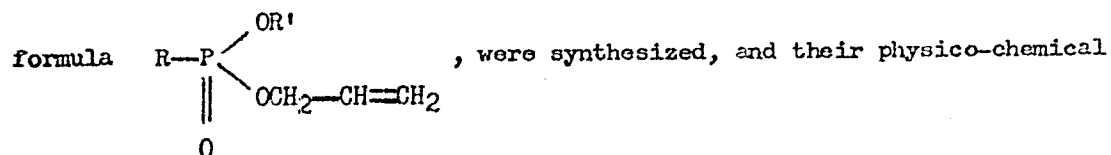
FAIZULLIN, I. N., MAKSHOVA, T. M., ISUROVA, A. I., FAYZZULLINA, D. A.,
ROMANOVA, T. I., and KUZNETSOV, YE. V.

"Allyl-Aryl Esters of Phosphorus Acids"

Moscow, Plasticheskiye Massy, No 2, Feb 72, pp 60-63

Abstract: A number of organophosphorus polymers are commonly obtained by polymerization of the allyl esters of the phosphorus acids. Since these polymers possess valuable properties, the synthesis of new phosphorus-containing monomers is a matter of practical interest.

Seven allyl-aryl esters of the phosphorus acids, having the general



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USSR

FAIZULLIN, I. N., et al., *Plasticheskiye Massy*, No 2, Feb 72, pp 60-63

characteristics (boiling point, phosphorus content, etc.) were determined. The esters were obtained from a two-stage reaction: 1) dichloroanhydride of phenylphosphoric acid with the corresponding alcohol, and 2) the corresponding acid chlorides of the esters with allyl alcohol in the presence of triethylamine in an ether medium.

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USSR

FAYZULLIN, I. N., FAYZULLINA, D. A., KUZNETSOV, Ye. V., GEPTER, Ye. L.,
ISUPOVA, A. I., MAKSUDOVA, T. M., Kazan' Chemical Scientific Research Insti-
tute

"Some Asymmetric Alkyl-Aryl Esters of Alkylphosphonic Acids (abstract of the
article)"

Leningrad, Zhurnal Obshchey Khimii, Vol 40 (102), No 11, Nov 70, p 2530

Abstract: The authors describe synthesis of chloride and allylaryl esters of methyl-, chloromethyl- and β -chloroethylphosphonic acids. The synthesis was done in two stages. In the first stage, methyl-, chloromethyl- and β -chloroethylphosphonyl dichlorides are interacted with phenols to produce the corresponding acid chloride esters. The second stage is interaction of the acid chloride esters with allyl alcohol in the presence of pyridine. The synthesized substances are colorless liquids which dissolve in organic solvents.

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1/2 031 UNCLASSIFIED PROCESSING DATE--18SEP70
TITLE--DIELECTRIC ANISOTROPY OF POLARIZED FERROELECTRIC CERAMICS AT
ULTRAHIGH FREQUENCY -U-
AUTHOR-(03)-KARGOPOLOVA, N.P., POPLAVKO, YU.M., ISUPROV, V.A.

COUNTRY OF INFO--USSR

SOURCE--FIZ. TVERD. TELA 1970, 12(2) 624-7

DATE PUBLISHED-----70

SUBJECT AREAS--MATERIALS, ELECTRONICS AND ELECTRICAL ENGR.

TOPIC TAGS--ANISOTROPY, DIELECTRIC PROPERTY, PIEZOELECTRIC CERAMIC, BARIUM
TITANATE, ZIRCONATE, ULTRAHIGH FREQUENCY, MICROWAVE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRA--1984/0138

STEP NO--UR/0131/70/012/002/0624/0627

CIRC ACCESSION NO--AP0054934

UNCLASSIFIED

2/2 031

UNCLASSIFIED

PROCESSING DATE--18SEP70

CIRC ACCESSION NO--AP0054934

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. PEROVSKITE CERAMICS WERE INVESTIGATED OF THE COMPN. RATIO SUB3, BASN SUB0.05 TI SUB0.95 O SUB3, DIFFERENT MODIFICATIONS OF THE CERAMICS TSTC (RHOMBO HEDRAL TETRAGONAL BA TITANATE ZIRCONATE), AND THE CERAMIC PB SUB0.6 BA SUB0.4 NB SUB2 O SUB6 WITH THE STRUCTURE OF TETRAGONAL K-W BRONZE. MEASUREMENTS OF THE DIELEC. CONST. EPSILON WERE CARRIED OUT AT 1 KHZ AND 27 GHZ IN WEAK FIELDS. MICROWAVE MEASUREMENT WERE CARRIED OUT BY THE WAVE RESONANCE METHOD.

UNCLASSIFIED

2/2 011

UNCLASSIFIED

PROCESSING DATE--02OCT70

CIRC ACCESSION NO--AP0107945

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. WHEN THE SMELT FROM A SODA RECOVERY FURNACE IS DISSOLVED (IN WEAK WHITE LIQUOR), A CONSIDERABLE AMT. OF A MIXT. OF STEAM AND GAS IS EVOLVED. THE MIXT. IS DISCHARGED INTO THE ATM. THROUGH AN EXHAUST PIPE AND CONTAINS SOLID PARTICLES ENTRAINED BY THE FLOW, WHICH CAUSE POLLUTION. THE APP. DESCRIBED WAS DESIGNED TO PURIFY THE MIXT. FROM THE ENTRAINED PARTICLES AND ALSO FROM GASEOUS S COMPONENTS. FROM THE TANK CONTG. THE SOLN., THE STEAM GAS MIXT. GOES TO A SCRUBBER CONSISTING OF A MIXING TUBE AND A GRAVITY CONDENSATE TRAP. THE WEAK WHITE LIQUOR FROM THE CAUSTICIZATION ROOM IS PUMPED, AT 1.5-2 BARS, INTO THE LOWER CONE OF THE CONDENSATE TRAP, WHERE THE LIQUOR USED FOR SPRAYING THE MIXING TUBE ALSO COLLECTS. THE LIQUOR FED IS CONTROLLED BY VALVES, AND A DEFINITE VOL. OF WEAK WHITE LIQUOR CIRCULATES CONTINUOUSLY THROUGH THE APP. THE APP. REMOVES 95PERCENT OF THE SOLID PARTICLES, AND NEARLY 100PERCENT OF THE S COMPS.

UNCLASSIFIED

USSR

UDC: 621.395.34

GINZBURG, V. M., ~~IS'YANOV, V. M.~~, Leningrad "Krasnaya Zarya" Production Union

"A Gerkon Electronic Automatic Telephone Exchange"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 9, Mar 72, Author's Certificate No 331500, Division E, filed 14 May 70, published 7 Mar 72, p 184

Translation: This Author's Certificate introduces: 1. A gerkon electronic automatic telephone exchange which has line switches, a switchboard and cord sets, line-switch and cord-set reference decoders, and a central control device which includes interconnected generators of line-switch and cord-set codes, an analyzer of the state of line switches and cord sets, and an actuating device. As a distinguishing feature of the patent, the volume of equipment is reduced and the interference suppression of the telephone exchange is improved by connecting the outputs of the line-switch code generator through the reference decoder to the reference inputs of the line switches, and through an interrogation circuit provided in the switchboard to the reference inputs of the cord sets connected at the given moment to

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— USSR

GINZBURG, V. M., IS'YANOV, V. M., USSR Author's Certificate No 331500

the line switches through the switchboard. The interrogation circuit is connected in parallel with the main information circuit, and the outputs of the cord-set code generator are connected through the reference decoder to the cord-set reference inputs. The outputs of the analyzer and actuating device are connected to the command inputs of the line switches and cord sets, whose outputs are connected through OR gates to the inputs of the analyzer. 2. A modification of this telephone exchange distinguished by the fact that the line switches and cord sets are simplified by connecting the outputs of the receivers and storage devices through interrogation diodes to the outputs of the line switches and cord sets. The inputs of the storage devices and of the hold and ringoff devices are connected through command diodes to the corresponding command inputs of the line switches and cord sets. The controlling inputs of all interrogation and command diodes are connected directly or through an OR gate to the reference inputs of the line switches and cord sets.

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1/2 039 UNCLASSIFIED PROCESSING DATE--30OCT79
TITLE--EMISSION SPECTRUM AND LONGITUDINAL MODE SELECTION IN A LASER WITH
ELECTROOPTICAL Q SWITCHING -U-
AUTHOR--(04)-GENKIN, R.O., ISYANOVA, YE.D., MARUGIN, A.M., OVCHINNIKOV,
V.M.
COUNTRY OF INFO--USSR
SOURCE--ZHURNAL PRIKLADNOI SPEKTROSKOPII, VOL. 12, FEB. 1970, P. 227-230
DATE PUBLISHED-----70
SUBJECT AREAS--PHYSICS
TOPIC TAGS--RUBY LASER, EMISSION SPECTRUM, SINGLE MODE LASER, LASER Q
SWITCHING
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1989/0915 STEP NO--UR/0368/70/012/000/0227/0230
CIRC ACCESSION NO--AP0107444
UNCLASSIFIED

2/2 039

UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0107444

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. DESCRIPTION OF AN OPTICAL ARRANGEMENT FOR NARROWING TO ONE LONGITUDINAL MODE THE EMISSION SPECTRUM OF AN ELECTROOPTICALLY Q SWITCHED RUBY LASER, USING A SPECIAL POLARIZATION ELEMENT WHICH SPLITS THE LASER RESONATOR INTO TWO CHANNELS. ONE EMISSION LINE WAS OBTAINED WITH A SPECTRAL WIDTH OF NOT MORE THAN 150 MHZ; EMISSION SPECTRA ARE ILLUSTRATED FOR BOTH CHANNELS SEPARATELY AND TOGETHER.

UNCLASSIFIED

USSR

UDC 547.26'118

ITALINSKAYA, T. L., SHVETSOV-SHILOVSKIY, N. I., KHLUDOVA, A. I., and
MEL'NIKOV, N. N.

"1,5,2,3-Phosphathiadiazoles"

Leningrad, Zhurnal Obshchey Khimii, Sep 71, Vol 41, No 9, pp 1980-1983

Abstract: Earlier research showed that the reaction of 1-chloro-4-alkyl(aryl)-2-phenyl-1,2-dihydro-1,5,2,3-phosphaoxadiazoles (I) with phosphorus thio-trichloride yielded 1-chloro-1-thio-4-alkyl(aryl)-2-phenyl-1,2-dihydro-1,5,2,3-phosphaoxadiazoles (II). Continuous heating of these compounds with phosphorus thiotrichloride leads to the replacement of oxygen in the ring with sulfur to form 1,5,2,3-phosphathiadiazoles (III). Addition of sulfur and triethylamine hydrochloride fails to affect the (II):(III) product ratio formed in the reaction of (I) with phosphorus thiotrichloride. Distilling the volatile reaction products of compounds (I) with phosphorus thiotrichloride by passing through dry nitrogen and the addition of ferrous trichloride facilitates the formation of compound (III).

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USSR

UDC 681.3.06:51

ITENBERG, I. I., KOSTELYANSKIY, V. M., LISOVENKO, N. N.

"Method of Compressed Placement of Tables of Values of Functions in Computer Memory"

Tr. NII Upravl. Vychisl. Mashin [Works of Scientific Research Institute for Control and Computing Machines], No 1, 1970, pp 91-95, (Translated from Referativnyy Zhurnal, Kibernetika, No 10, 1971, Abstract No 10 V776).

NO ABSTRACT.

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USSR

UDC 616-001.36+612.275.1

ITIKENOV, N. A., Chair of Faculty Surgery and Chair of Traumatology, Orthopedics, and Military Field Surgery, Kirgiz State Medical Institute

"Experimental Burn Shock Under High-Altitude Conditions"

Frunze, Sovetskoye Zdravookhraneniye Kirgizii, No 2, Mar/Apr 71, pp 32-37

Abstract: In experiments conducted on dogs and rats, experimental burn shock was produced in animals either adapted to a high altitude by keeping them in a location 3,400 m above sea level or not adapted to it (kept in the city of Frunze, which has an elevation of 760 m above sea level). The animals that had been adapted to a high altitude survived shock for a longer period of time after infliction of the trauma than the animals which had not been adapted. The higher resistance to burn trauma of the adapted animals was due to a lower blood concentration, higher oxygenation stability of the arterial blood, better oxygen utilization, and a reduced denaturation of plasma protein in the torpid stage of shock. The beneficial shifts indicated were associated with a maximum mobilization of protective and adaptive mechanisms that counteract hypoxia, so that the organism responded in a higher state of readiness to the stress due to shock. The increased resistance to burn shock was retained by the adapted animals for several days after their return to the lower elevation, as shown

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USSR

ITIKENOV, N. A., Sovetskoye Zdrovookhraneniye Kirgizii, No 2, Mar/Apr 71,
pp 32-37

by experiments in which the burn trauma was inflicted at the lower elevation upon return of the animals to it. One month after the return of adapted animals to the lower elevation, their increased resistance to burn shock was lost.

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USSR

UDC: 681.2.083:531.787.913:531.768

BARBAS, I. G., ZAKHAROV, V. N., ITIN, M. Ye., KRUTIKOV, I. A.

"Use of Semiconductor Strain Gauges for Measuring Accelerations"

Materialy Yubileyn. nauchno-tekhn. konferentsii Dnepropetr. in-ta inzh. Zh.-d. transp. (Materials of the Jubilee Scientific and Technical Conference of the Dnepropetrovsk Institute of Railway Transportation Engineers), Dnepropetrovsk, 1970, p 266 (from RZh-Metrologiya i Izmeritel'naya Tekhnika, No 11, Nov 70, Abstract No 11.32.448)

Translation: The authors present the design and construction of an acceleration pickup in which semiconductor strain-gauge resistors were used as the sensing elements. The pickup can be used to measure the acceleration of processes with frequencies ranging from 0 to 200 Hz and amplitudes of up to 50 *g* (*g* is the acceleration due to gravity). Consideration is given to the possibility of introducing critical damping of the elastic element of the pickup by various methods, as well as using electrical damping in the amplification channels. The suitability of the given pickup for measuring accelerations of the various elements of rolling stock was checked out on test runs.

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USSR

UDC 536.46:533.6

ITIN, V. I., NAYBORODENKO, Yu. S., KOZLOV, Yu. I., USHAKOV, V. P.

"Gasless Combustion of a Mixture of Metal Powders"

V sb. Gorenive i vzryv (Combustion and Explosion -- Collection of Works),
Moscow, "Nauka", 1972, pp 142-147 (from RZh-Mekhanika, No 3, Mar 73, Abstract
No 3B962)

Translation: This paper is concerned with the study of the gasless combustion of mixtures of nickel-aluminum and copper-aluminum powders, the kinetics of reaction diffusion in these mixtures and the increase in volume of bricks due to the formation of new phases. Equations are obtained describing thermal and volume effects in a mixture of metal powders. Authors' abstract.

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UDC 620.183.48

USSR

ITIN, V. I., KOZLOV, Yu. I., PUGINA, L. I., YURCHENKO, A. G., SAVITSKIY, K. V. (Deceased), and FEDORCHENKO, I. M., Institute of Problems of Material Science, Academy of Sciences Ukrainian SSR

"Study of the Sintering, Structure and Phase Composition of Nickel Alloy-Base Metal-Graphite Materials. Report 1. Study of the Sintering Process of Nickel-Base Materials and Both the Structure and Phase Composition of Nickel-Copper-Graphite Alloys"

Kiev, Poroshkovaya metallurgiya, No 10, Oct 71, pp 26-31

Abstract: The study concerns the process of sintering as well as phase and structural changes occurring during sintering in Ni alloy-base metal-graphite materials. The experimental materials comprised 80% Ni and 20% Fe or 20% Cu with 30 and 50% (by vol.) graphite. The addition of graphite to Ni-Cu and Ni-Fe alloys markedly reduces both the amount of shrinkage and its rates during sintering. With 50% graphite the compression gives way to volumetric growth. Cu additions result in greater volumetric growth than Fe additions. The major cause of volumetric growth is believed to be the formation of inclusions isolated between particle surfaces, interaction with oxides to form gases, and desorption gases from the graphite resulting in a breakdown

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USSR

ITIN, V. I., et al., Poroshkovaya metallurgiya, No 10, Oct 71, pp 26-31

of contacts. Graphite additions cause the separation of Cu and Ni particles and reduce the alloy's homogeneity. In Cu-Ni alloy-base metal-graphite materials, graphite becomes an inert addition and spreads over the structure in the form of a separate inclusion in the metal matrix -- the solid solution of Cu in Ni. (5 illustrations, 5 bibliographic references)

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1/2 024 UNCLASSIFIED
TITLE—STABILIZATION OF POLYCARBONATES —U—

PROCESSING DATE--30CCT70

AUTHOR—(05)—KOVARSKAYA, B.M., KUTRELEV, V.N., KIRPICHNIKOV, P.A.,
LEVANTOVSKAYA, I.I., ITINSKAYA, G.P.
COUNTRY OF INFO—USSR

SOURCE—USSR 264,689
REFERENCE—UTKRYTIYA, IZJBRET., PROM. OBRAZTSY, TOVARNYE ZNAKI 1970;
DATE PUBLISHED--03MAR70

SUBJECT AREAS—CHEMISTRY, MATERIALS

TOPIC TAGS--POLYCARBONATE, CHEMICAL STABILIZER, LOW TEMPERATURE EFFECT,
ORGANIC PHOSPHORUS COMPOUND, ARYL PHOSPHINITE, CHEMICAL PATENT

CONTROL MARKING—NO RESTRICTIONS

DOCUMENT CLASS—UNCLASSIFIED
PROXY REEL/FRAE—3002/1468

STEP NO--UR/0482/70/000/000/0000/0000

CIRC ACCESSION NO--AA0128867
UNCLASSIFIED

2/2 024

UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AA0128867

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. POLYCARBONATES ARE STABILIZED AND
TREATED AT LOW TEMPS. USING 0.1-1 WT. PERCENT POLYPHOSPHINITE STABILIZERS
(I, N EQUALS 5-10).

UNCLASSIFIED

USSR

UDC 621.373.920.145:16

DMITRIYEV, V.G., YERSMEYEVA, R.A., YERSHOV, A.G., ITKHOMI, I.YA., KARPOVA, YE.P.

"Engineering Calculation And Optimization Of Parameters Of Optical Band Frequency Doublers"

Kvantovaya elektronika (Quantum Electronics), Moscow, No 5(11), 1972, pp 72-79

Abstract: At the contemporary level of development of experimental nonlinear optics, the necessity for engineering calculation and optimization of the parameters of frequency doublers is dictated by the appearance of a large number of nonlinear crystals which make it possible to obtain a high efficiency of conversion into the second optical harmonic without special focusing schemes. As a rule, relatively powerful solid-state lasers are used as the source of initial radiation. The radiation of the lasers introduces a pronounced pulse character and the divergence substantially exceeds the diffraction limit. During calculation of frequency doublers of such lasers it is necessary because of the back reaction to take into account both the pulse character of the initial radiation and the effect of saturation of the harmonic. Calculation of the generated factors introduces a number of special features in the nature of the calculation of the efficiency of conversion, such as determination of the optimum ratio

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USSR

DMITRIYEV, V. G., et al., Kvantovaya elektronika, No 5(11), 1978, pp 72-79

between the intensity of the exciting wave and the length of the nonlinear crystal, and others. The methods of calculation used in the present work were developed by others for the case of a prescribed field of initial frequency, and for a substantially nonlinear regime. For production of engineering graphs it is most advisable to conduct numerical integration of equations because analytical methods of calculation, valid in some approximations, lead to fairly awkward solutions. 5 fig. 1 tab. 11 ref. Received by editors, 6 Oct 1971.

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USSR

UDC 621.382.2

GODOV, A.N., GORYUNOV, N.N., ITKIN, B.YA., KOTOV, V.N.

"Evaluation Of The Quality Of Transistors With Respect To Transient Thermal Responses"

Elektron. tekhnika. Nauchno-tekhn. sb. Upr. kachestvom i standartiz. (Electronic Technology. Scientific-Technical Collection. Quality Control And Standardization), 1970, Issue 3, pp 22-28 (from RZh--Elektronika i yeye primeneniye, No 4, April 1971, Abstract No 43595)

Translation: An account is given of a new method for evaluation of the quality of transistors with respect to transient thermal responses. A unit for observation of these responses is described. The solution of an equation for thermal conductivity is presented, which makes it possible to analyze thoroughly transient thermal responses obtained experimentally. Summary.

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USSR

UDC 621.382.3

GORYUNOV, E.N., DEMINA, G.M., ITKIN, B.YA., MCSTOVLYANSKIY, N.S.

"Investigation Of Transistors Rejected During Tests Under An Electrical Load"

Elektron. tekhnika. Nauchno-tekhn. sb. Poluprovodn. pribory (Electronic Technology. Scientific-Technical Collection. Semiconductor Devices), 1970, No 1(51), pp 106-115 (from RZh--Elektronika i yeye primeneniye, No 12, December 1970, Abstract No 12B177)

Translation: On the basis of an analysis of the overall rejections (breakdowns) of Type P605-P606 conversion Ge transistors of average power, the weak spots in the transistor structure developed during tests under an electrical load is where formation of a short circuit is most probable. It is shown that breakdowns of the emitter-collector junction originate with a decrease of the distance from the emitter to the groove [kanavka]; an acute angle of the emitter (and consequently of the collector junction) in the interior of the crystal at the ends of the emitter strip increases the intensity of the electrical field in the area of the space charge of the collector, which also can lead to a breakdown; and a breakdown of the base-collector develops in the area of increased intensity of the field and at points of mechanical defects. Several other causes of breakdowns are considered. 8 ill. 2 ref.

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Burn Studies

USSR

UDC 617-001.17-07:616.831-091.8

ITKIN, S. I., Department of Pathological Anatomy, Institute of Surgery imeni
~~A. V. Vishnevskiy~~, Academy of Medical Sciences USSR

"Histopathological Changes in the Central Nervous System After Experimental
Thermal Burns"

Moscow, Eksperimental'naya Khirurgiya i Anesteziologiya, No 5, 1971, pp 56-59

Abstract: Histological examination of various parts of the brain (cortex, hypothalamus, mesencephalon, cerebellum, medulla oblongata, and so forth) of dogs who sustained hot water burns covering 20 to 25 percent of the body surface revealed swelling, hydropic degeneration, and wrinkling of nerve cells as well as edema and swelling of brain tissues. The pathogenetic factor responsible for these changes was the disturbance of neurohumoral regulation of vascular tone and blood circulation. The disruption of the cerebral blood flow and resulting impairment of the oxidation-reduction processes, increased permeability of the capillaries at and beyond the burn site, loss of plasma, and disturbance of protein metabolism upset the dynamic equilibrium existing between the intravascular and interstitial fluids. In the animals that survived, the adaptive mechanisms of the central nervous system restored the structure of the neurons and normalized

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USSR

ITKIN, S. I., Eksperimental'naya Khirurgiya i Anesteziologiya, No 5, 1971,
pp 56-59

their metabolism as manifested by productive reaction of astrocytes and
oligodendrocytes, mobilization of the microglia, and appearance of peri-
cytes. This reaction of the neuroglia was inhibited in the dead animals.

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USSR

UDC 615.361.419.014.41

PUSHKAR', N. S., OBOZNAYA, E. I., SHAKHBAZOV, V. G., DATSENKO, P. M., and
ITKIN, Yu. A., Ukrainian Institute of Advanced Training of Physicians,
Ministry of Health USSR, Kharkov

"The Effect of Polyethylene Oxide on Myelokaryocyte Respiration After the
Freezing of Bone Marrow to -196°C "

Moscow, Problemy Gematologii i Perelivaniya Krovi, No 4, 1971, pp 52-54

Abstract: The effect of freezing on the intensity of oxygen uptake by bone marrow cells from cancer patients and healthy persons was studied in relation to the rate of freezing to -196°C and the type of cryoprotective agent used (glycerin, 10%, and the newly developed polyethylene oxide). Myelokaryocytes from healthy persons take up oxygen much more rapidly than those from cancer patients. The addition of polyethylene oxide to a suspension of the cells before freezing had little effect on oxygen uptake, whereas the addition of 10% or glycerin depressed it sharply. Two-stage freezing (at the rate of $1^{\circ}/\text{min}$ to -15° and then at the rate of either 200° or $10^{\circ}/\text{min}$ to -196°) was more effective in protecting the cells than single-stage freezing (from 0° to -196° at the rate of either $200^{\circ}/\text{min}$ or $10^{\circ}/\text{min}$). Bone marrow frozen with polyethylene oxide has already successfully undergone clinical trials.

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Hematology

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USSR

UDC: 615.361.419.014.413

DATSENKO, B. M., BULATOVA, R. F., PUSHKAR', N. S., ITKIN, Yu. A., KOGAN, V. S., and KOZ'MIN, Yu. V., Ukrainian Institute for the Advanced Training of Physicians, Ministry of Health USSR, and Physico-technical Institute, Academy of Sciences Ukrainian SSR, Kharkov

"Mechanism of the Protective Action of Polyethylene Oxide on Bone Marrow Cells Freezing to -196°C "

Moscow, Problemy Gematologii i Perelivaniya Krovi, Vol 15, No 11, Nov 70, pp 32-37

Abstract: X-ray diffraction analysis and low-temperature crystallography showed that little polyethylene (as compared to glycerin) penetrates bone marrow cells frozen to -196°C . The bulk of the substance remains outside, forming a coating around the cells, and hence exerts a protective effect. Electron microscope study of erythrocytes present in the frozen bone marrow cells revealed many cavities formed as a result of intracellular crystallization. The size of the pieces of ice increased from the periphery to the center, where a large ice crystals were sometimes found. In the light of the suggested mechanism of action of

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DATSENKO, B. M., et al, Problemy Gematologii i Perelivaniya Krovi, Vol 15, No 11, Nov 70, pp 32-37

polyethylene oxide, the increased number of crystals in the erythrocytes from the periphery to the center is considered to be the result of a quantitative decrease in the cryophylactic agent in the cells in the same direction.

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1/2 021 UNCLASSIFIED PROCESSING DATE--11DEC70
TITLE--LITHIUM HYDROXIDE CESIUM HYDROXIDE WATER SYSTEM AT 50, 100, AND
150 DEGREES -U-
AUTHOR--(C2)--OSTROVITYANOVA, S.E., ITKINA, L.S.
COUNTRY OF INFO--USSR
SOURCE--ZH. NEORG. KHIM. 1970, 15(3), 765-9
DATE PUBLISHED-----70
SUBJECT AREAS--CHEMISTRY
TOPIC TAGS--LITHIUM COMPOUND, HYDROXIDE, CESIUM COMPOUND, WATER, X RAY
DIFFRACTION, IR SPECTROSCOPY
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRA--3001/0712 STEP NO--UR/0076/70/015/003/0765/0769
CIRC ACCESSION NO--AP0126424
UNCLASSIFIED

2/2 021

UNCLASSIFIED

PROCESSING DATE--11DEC70

CIRC ACCESSION NO--APC126424

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE SOLY. OF LIOH-CSOH-H SUB2 O
WAS DETD. AT 50, 100, AND 150DEGREES, AND THE SOLY. DIAGRAM WAS
CONSTRUCTED. CRYSTN. FIELDS AND NS OF LIOH, CSOH, CSOH.H SUB2 O, AND
(5-6)LIOH.CSOH(I) WERE DETD. STUDY OF I BY X RAY DIFFRACTION, IR
SPECTROSCOPY, AND THERMOGRAVIMETRY PROVED THAT IT IS AN INDIVIDUAL
COMPD.

UNCLASSIFIED

USSR

UDC: 62-55

YEMEL'YANOV, S. V., UTKIN, V. I., ITKIS, Yu. E., and LEYBOVICH, A. V.

"Centralized Control of a Combination of Dynamic Objects"

USSR Author's Certificate No. 282479, filed 10 Sept 68, published 17 Feb 71 (from RZh-Avtomatika, telemekhanika i vychislitel'naya tekhnika, No. 12, 1971, Abstract No. 12A153P)

Translation: The invention may be used in automatic control of a combination of dynamic objects with varying characteristics: for example, for simultaneous control of the temperature in several zones of multisectional heaters and seasoning ovens. The known method of centralized control of a combination of dynamic objects uses a central regulator of the relay type which is, in turn, connected to each of the controlled objects. In this method, however, the sequence of connections of the controlled objects to the central regulator is inefficient from the viewpoint of rapid action. The proposed method differs in that, at each moment of time, control is exerted only over those objects in which a comparison signal (formed from a signal representing the difference between the object and the derivatives of the signal or the inner coordinates of the object replacing them) has the greatest value of $1/2$

USSR

UDC: 62-55

YEMEL'YANOV, S. V., et al, USSR Author's Certificate No. 282479

corresponding comparison signals for the other objects. This permits increasing the speed of action of the system.

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- 11 -

Polymers and Polymerization

USSR

UDC 678.742.2-137.46.22:66.018.86

TERTERYAN, R. A., LESHCHENKO, S. S., LIVSHITS, S. D., COLOSOV, A. P.,
ITSIKSON, L. B., MONASTYRSKIY, V. N., KARPOV, V. L., SOBOLEVA, N. S.,
MAL'TSEVA, A. P., and ISKHAPOV, L. I.

"Radiation Stability of Ethylene and Styrene Copolymers"

Moscow, Plasticheskiye Massy, 7, 1973, pp 3-5

Abstract: A study was made of the continuous statistical copolymerization of ethylene monomers (E) with styrene (S) under conditions similar to those under which low density polyethylene is produced and also of the behavior of E + S polymers in an ionizing radiation field. The results of copolymerization studied -- grams of copolymer/hr concentration of S in the polymer, density, and others -- are given as a function of styrene concentration and pressure at 200°C. An increase in the concentration of S in the reaction mixture leads to a decrease in the copolymer yield, in its characteristic viscosity, in its melting temperature, and its crystallinity, and to an increase in the density. The presence of S monomers in the polyethylene chains and the chemical bonds between them and the methylene groups significantly increases the resistance of the material to α -radiation damage. The gases evolved during the radiation of various types of polymers were determined.

1/1

ITSIKSON, M. I.

JPRS 55884

4 May 1972

UDC 558.21(227.1+728)

BASIC FEATURES IN METALLOGENESIS OF NORTH-EASTERN PART OF PACIFIC BELT (NORTHWEST CORDILLERAS AND ALASKA)

[Article by V.I. Berger and M.I. Itsikson, Moscow, Sovetskaya Geologiya, 1972, No. 1, 1972, pp. 90-106]

One of the most effective methods for predicting the ore-bearing regions is the technique of analogies based on comparative metallogenic analysis. From this viewpoint, it is logical to examine the features in the metallogenic development of the territory (outstanding in respect to its mineral resources) of Alaska and the Canadian Cordillera in the light of regional-metallogenic concepts of the Soviet metallogenic school of thought. An analysis conducted on this territory--an important link in the Pacific metallogenic belt noted by S.S. Smirnov [7]--will permit us to direct our attention on certain issues which can be utilized in predicting the ore-bearing regions in the East of the USSR.

At the basis of the article, we have placed literary sources and a map of British Columbia, Alaska and the Yukon Territory. We have also used numerous reports on individual types and groups of endogenous deposits, published in recent years (11, 12, 13, 14, 15, 16, 17, 18). Uniquely valuable material has been generalized in the collection "Geologic History and Mineral Deposits of the Northern Cordillera" (Snelair, White, Ray, Armstrong and others) [19].

Based on analyzing all the published data, we have compiled a chart of metallogenic and other charts which are included in the present report.

The geological basis for these graphic presentations has been provided by the "Geologic Map of North America to a scale of 1:5,000,000 published by the U.S. Geologic Survey in 1965 and comments at the Institute of Arctic Geology: "Geologic Map of Alaska, Northwest Islands and Northwestern Part of Canada" on a scale of

(1 - USSR - 8)

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USSR

UDC: 551.596:534.143

ITSIN, V. B., KAKALOV, V. A.

"On a Method of Evaluating the Interference Immunity of a Detector of Wide-Band Signals Under Conditions of a Nonstationary Interference Field"

Moscow, Tezisy dokl. 3-y Vses. shkoly-seminara po stat. gidroakustike, 1971
--sbornik (Abstracts of Papers of the Third Soviet-Wide Seminar-School of
Statistical Hydroacoustics, 1971--collection of papers), 1972, pp 230-237
(from RZh-Fizika, No 5, May 73, abstract No 5Zh646 by B. P. Sukhin)

Translation: The procedure for evaluating a wideband signal detector under conditions of nonstationary interference is based on comparing analogous circuits in a stationary field with respect to the output effect of the post-detector filter. The result is presented in the form of loss of interference immunity evaluated by equivalent broadening of the band of the post-detector filter. The experimental data were obtained on a device which realizes an adaptive method of processing with limitation. The given quantitative estimates of relative loss of interference immunity may be considered typical; the procedure can be used to compare the effectiveness of different detectors under identical, real conditions.

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USSR

IL'INA, M. A., ITSKEVICH, Ye. S., and KALYUZHNYAYA, G. A.

"Effect of Pressure on the Superconductivity of Niobium Diselenide"

Leningrad, Fizika Tverdogo Tela, Vol 14, No 2, 1972, pp 515-517

Abstract: The results are given of experiments designed to probe the effects of quasi-hydrostatic pressure of up to 100 kbar on the transition temperature of NbSe₂ in the superconductive state. The NbSe₂ specimen was crystallized in a layered hexagonal structure with a distance of 12.56 Å between layers, which consisted of two solidly packed selenium sheets with niobium atoms in triangular-prismatic hollows. Temperatures of 4.2°K and up were obtained by warming a cold multiplier above the level of liquid helium in a Dewar and were determined through the use of a thermocouple consisting of copper and a gold-silver alloy. Curves are given for the electrical resistance of the specimens as a function of the temperature at various pressures, for the critical temperature of the superconducting transition of the NbSe₂ as a function of the pressure, and for the critical temperature as a function of the distance between the layers. Members of the Institute of High Pressure Physics, USSR Academy of Sciences, the authors express thanks to L. F. Vereshchagin and B. M. Vul for their support.

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- 90 -

Acc. Nr.

AP0053899

Abstracting Service:
CHEMICAL ABST. 6-70

Ref. Code
UR0386

115828e High-pressure superconductivity of barium. Il'ina, M. A.; Iuskevich, E. S. (Inst. Fiz. Vys. Davlenii, Moscow, USSR). Pis'ma Zh. Eksp. Teor. Fiz. 1970, 11(1), 26-8 (Russ). The temp. dependence of the elec. resistance (R) of a hexagonal modification of Ba arising at 25° and pressure p 59 kilobars was studied at 1.55-4.0°K and 60-100 kilobars. At 60-85 kilobars, R did not decrease at $T \geq 1.55^\circ\text{K}$. The supercond. transition began at 85 kilobars and 1.55°K. The temp. of this transition (T_k) reached its max. 3.05°K at 88 kilobars and then sharply decreased linearly with p according to the equation $dT_k/dp = -(1.5 \pm 0.5) \times 10^{-4}^\circ\text{C/bar}$. Karel A. Hlavaty.]

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USSR

UDC: None

ITSKHOKI, Ya. S.

"Standardizing Notation in Radio Engineering and Electronics"

Moscow, Radiotekhnika, Vol. 25, No. 11, 1970, pp 105-107

Abstract: Recommendations made by various authors for revising and standardizing engineering and mathematical notation are discussed in this article, in keeping with recently begun checks on GOST (All-Union Government Standards) regulations in radio engineering and electronics. Such problems are now being discussed in the VUZ (Higher Education Institutes), in the press, and among specialists. Some of the suggestions of G. V. Voyshvillo, published in the same journal as that noted above (Vol. 24, 1969, No. 2) are advanced with the caution that they are not necessarily recommended. Voyshvillo would like to see Latin letters instead of Cyrillic in such standard subscripts as "input" and "output": i.e., "in" instead of "vkh" and "ex" instead of "vykh." The author of the present article generally disparages the arguments of the innovator, although he admits that it is useful to keep such Latin notation as "u" for voltage, "v" for velocity, "max" for maximum.

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ITSKOVA, A. I.

JPRS 55320
1 MAR 72
UDC: 613.31:577.17.049]-074

SOME METHODOLOGICAL APPROACHES TO HYGIENIC INVESTIGATION OF TRACE ELEMENTS IN DRINKING WATER

Article by Lid. Nikolajevna, A. I. Itskova; Moscow, Vostrik Akademii Meditsin-
skikh Nauk SSSR, Novosibirsk, No 1, 1972, pp 78-81]

There has not been sufficient investigation of the hygienic aspects of the problem of trace elements in drinking water. Yet studies of recent years indicate that a number of trace elements play a substantial part in the vital activities of man and animals. It was established that an excess or shortage of some trace elements in the environment leads to onset of a number of endemic diseases of man and to enzootic diseases (A.O. Vojnar).

The need for further expansion of hygienic research to assay trace elements in drinking water is determined by many circumstances. The economic development of arid and drought afflicted territories as well as pollution and depletion of open reservoirs in a number of cases lead to increasing use of deep subterranean water for drinking purposes, which often contains higher quantities of trace elements.

In some cases the hydrochemical conditions of reservoirs are altered due to dumping of industrial wastes into them. When evaluating the situation existing in reservoirs, one must take into consideration the fact that surface water supply plants do not provide removal of most substances that are usually referred to the trace element group from the water.

The use of trace elements in agriculture, as fertilizer, for example, of fertilizers, sugar, and others, is a new source of increased access of such elements into reservoirs.

Substantial quantities of trace elements (boron, bromine, nickel) in chemical preparations may be present in desalinated water used to supply irrigation communities in dry or drought areas. This is due to the fact that some desalination methods do not completely remove trace elements, or else they get into the water as a result of corrosion of the desalination equipment.

USSR

UDC 632.95

ITSKOVA, A. L., GAR, K. A., MANDEL'BAUM, YA. A., FETISOVA, V. F., and ORLOVA, V. I.

"An Arcaricide"

USSR Authors' Certificate No 267244, Cl. A 01 n 9/36; A 01 n 9/14, filed 16 Sep 68, published 17 Jan 72 (from RZh-Khimiya, No 14, 25 Jul 72, Abstract No 14N468 by T. A. Belyayeva)

Translation: For the control of spider mites the authors suggest application of a thiophosphate with the general formula $(RO)(R'R''N)P(O)SCH_2CON(Et)SO_2Me$ (I) ($R = Me$ or Et ; $R' = Me, Et, Pr$; $R'' = H, Me, Et$). Results of I tests on spider mite specimens are presented.

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USSR

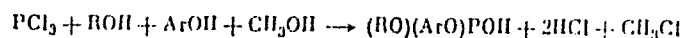
UDC 547.26'118

MANDEL'BAUM, Ya. A., ~~ITSKOVA, A. L.~~, and MEL'NIKOV, N. N.

"Synthesis of O-Aryl O'-Alkyl Phosphites"

Leningrad, Zhurnal Obshchey Khimii, Vol 42(104), No 3, Mar 72, pp 502-503

Abstract: The authors investigate the possibility of synthesizing alkyl aryl phosphites in a single step from phosphorus trichloride, the corresponding alcohol and phenol. Methanol was used as the donor of the hydroxyl group.



Isolation of the O-aryl O'-alkyl phosphites is impeded by the symmetric dialkyl- and diaryl phosphites formed as by-products. Chemical and physical data are tabulated for eleven synthesized O-aryl O'-alkyl phosphites.

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USSR

UDC: 62-55

ITSKOVICH, I. A., and ZAYDEL', Yu. G. /All-Union Scientific Research Institute of Railway Car Construction/

"Device for Automatic Distribution and Analysis of Dynamic Processes"

USSR Author's Certificate No 299840, filed 3 Oct 68, published 26 April 71 (from RZh-Avtomatika, telemekhanika i vychislitel'naya tekhnika, No. 12, 1971, Abstract No. 12A146P)

Translation: The invention is concerned with the area of equipment analysis of random processes. Known devices for automatic control and analysis of dynamic processes do not permit simultaneous treatment of several random processes. The treatment of only synchronous random processes is possible in the time distribution of pulses from an amplitude analyzer. The proposed device is different in that the distribution of the random processes to be treated is done at the inputs of the amplitude analyzer through the use of a grid shaper for the reference voltage phases. Made in this way, the device can analyze several asynchronous random processes.

Resume

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USSR

UDC: 8.74

ITSKOVICH, I. A., STRELKO, R. S. (editors)

"Algorithms and Programs for Realization of National Economic Models"

Algoritmy i programy realizatsii narodnokhozyaystvennykh modeley. AN SSSR. Sib. otd. In-t ekon. i organiz. prom. proiz-va. M-vo priborostr. sredstv avtomatiz. i sistem upr. NII avtomatizir. sistem planir. i upr. (cf. English above. Academy of Sciences of the USSR. Siberian Department. Institute of Economics and Organization of Industrial Production. Ministry of Instrument Building of Means of Automation and Control Systems. Scientific Research Institute of Automated Planning and Control Systems), Novosibirsk, 1971, 150 pp, ill. 59 k. (from RZh-Kibernetika, No 5, May 72, Abstract No 5V531K)

Translation: Articles are abstracted separately.

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USSR

UDC 51:330.115

ITSKOVICH, I. A.

"Optimization Multibranch Dynamic Model of the National Economy"

Probl. Narodnokhoz. Optimuma [Problems of the National Economic Optimum -- Collection of Works], No 3, Part 1, Novosibirsk, 1970, pp 117-155, (Translated from Referativnyy Zhurnal, Kibernetika, No 6, 1971, Abstract No 6 V542 from the Introduction).

Translation: An optimization multibranch dynamic model is studied, in which the desired quantities are the volumes of production of products of branches in the first and second subdivisions and the dimensions of capital investments per branch.

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USSR

UDC: 512.25/.26+519.3:330.115

ITSKOVICH, I. A., ANDERSON, M. V.

"Concerning the Stability of the Condition of Complementary Nonrigidity"

V sb. Mat. metody resheniya ekon. zadach (Mathematical Methods of Solving Economic Problems--collection of works), Novosibirsk, "Nauka", 1971, pp 153-166 (from RZh-Kibernetika, No 9, Sep 71, Abstract No 9V482)

Translation: The conditions of optimality for the problem of linear programming $\max\{cx \mid Ax \leq b, x \geq 0\}$ may be written in the form

$$Ax + y = b, \quad A^T u - v = c, \quad (1)$$

$$xv = 0, \quad uy = 0, \quad x, y, u, v \geq 0 \quad (2)$$

The approximate method proposed by Parizo [transliterated from the Russian] (RZh-Mat, 1962, 5V444) is based on replacing (2) by the conditions

$$x_k v_k = p_k, \quad k=1, \dots, n; \quad u_l y_l = q_l, \quad l=1, \dots, m, \quad (3)$$

where p_k, q_l are positive numbers, and solving a sequence of systems of equations (1), (3) for $p^{(i)}, q^{(i)} \rightarrow 0$. The stability of such a method is proved in the article.

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USSR

ITSKOVICH, I. A., ANDERSON, M. V., Mat. metody resheniya ekon. zadach,
Novosibirsk, "Nauka", 1971, pp 153-166

Theorem. Let the direct and dual problems have unique optimum solutions \bar{x} and \bar{u} . Then in whatever way the positive vectors $p^{(t)}, q^{(t)}$ may approach zero, the corresponding solutions of systems $x(p^{(t)}, q^{(t)})$, $u(p^{(t)}, q^{(t)})$ will approach the optimum solutions \bar{x}, \bar{u} .

An analogous result is obtained as well for the problem

$$\min \{ \varphi(x) + cz \mid Ax + Bz \geq b, x \geq 0, z \geq 0 \},$$

where $\varphi(x)$ is a function which is strictly convex downward. S. Lebedev.

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USSR

UDC [537.226+537.311.33].01

VINETSKIY, V. L., ITSKOVSKIY, M. A., and KUKUSHKIN, L. S.

"Interaction of Conduction Electron With Transverse and Longitudinal Optical Vibrations in Ionic Crystals"

Vzaimodeystviye elektronov provodimosti s poperechnymi i prodol'nymi opticheskimi kolebaniyami v ionnykh kristallakh (cf. English above, Physics Institute, Academy of Sciences Ukrainian SSR, No 2), Kiev, 1971, 16 k., rotaprint (from RZh-Fizika, No 1, Jan 72, Abstract No 1YE1058)

Translation: The article considers the interaction of conduction electrons with vibrations in ionic crystals which have an isolated type of transverse optical vibrations (e.g., "soft" mode in perovskite ferroelectrics, doubly degenerate mode of transverse optical vibrations in diatomic alkali-halide crystals). At the same time, for purposes of comparison the same method is used to study the interaction with longitudinal optical vibrations, a precision study being made of the crystal lattice (so-called lattice model in which interaction with the internal field created by longitudinal and transverse vibrations can be taken into account, in contrast to the continuum model where only interaction with the macroscopic field of longitudinal vibrations is taken into consideration). On the basis of the model of polarizable ions, the authors consider the

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USSR

VINETSKIY, V. L., et al., Vzaimodeystviye elektrona provodimosti s poperechnymi i prodol'nymi opticheskimi kolebaniyami v ionnykh kristallakh, Kiev, 1971

Hamiltonian of the interaction of the "superfluous" electron with both longitudinal and transverse optical vibrations. From the form of the "transverse" Hamiltonian it follows that there is no interaction with transverse vibrations for crystals with minimum energy at the center of the Brillouin zone. An analysis is made of limiting cases where interaction with optical vibrations can be regarded as perturbation (case of a weak bond) and where it is great (case of a strong bond).

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USSR

VINETSKIY, V. L.; ~~TRSKOVSKIY, M. A.~~; KUKUSHKIN, L. S. (Institute of Physics, Ukrainian Academy of Sciences, Kiev)

"Interaction of a Conduction Electron with Transverse Optical Oscillations in Ionic Crystals"

Leningrad, Fizika Tverdogo Tela; January, 1971; pp 76-86

ABSTRACT: The Hamiltonian of the interaction of a conduction electron with longitudinal and transverse optical oscillations of a lattice of polarized ions is expressed through static and high-frequency permittivity.

It was shown that for crystals with a minimum of energy in the center of the Brillouin zone interaction with transverse oscillations is absent. For the case of several minima in the zone, the authors calculated the electron mobility with scattering by transverse optical oscillations (μ_{\perp}), comparable with mobility with scattering by longitudinal oscillations μ_{\parallel} for crystals with ordinary values of ϵ_0 and ϵ_{∞} and playing a basic role, as in ferroelectrics, with large values of the static permittivity of ϵ_0 . Comparison of the theoretical mobility

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USSR

VINETSKIY, V.L., et al, Fizika Tverdogo Tela; January 1971; pp 76-86

μ_1 with the experimental for barium titanate (BaTiO_3) explains the so-called "positive-temperature drag effect" in the region of phase transition; also obtained was the approximate quantitative agreement of the theoretical mobility with the experimental.

When the interaction with transverse optical oscillations in the zero approximation of the theory is taken into account, the corresponding polaron functional is obtained, an analysis of which shows that in crystals a "transverse" polaron only of small radius is possible; the contribution of transverse oscillations to a "longitudinal" polaron in macroscopic theory is negligible.

2/2

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USSR

UDC 621.385.017.72:536.58(C88.8)

BAKEYEV, P.B., SOYKO, B.I., ITUNIN, L.L., SERBINOV, A.M., KROMOV, YU. D.

"Unit For Control Of The Temperature Of Electrovacuum Devices"

USSR Author's Certificate No 262527, filed 2 Dec 68, published 13 May 70 (from
RZh--Elektronika i yeye primeneniye, No 12, December 1970, Abstract No 12A113F)

Translation: A unit is proposed for control of the temperature of electrovacuum devices, which contains a curved thermosensitive plate acting on the regulating organ for the flow rate of a coolant flowing in a spiral which encircles the body of the device. At the extremes of the coils of the spiral, two intermediate plates are attached at the outer extremity of which the thermosensitive plate is secured and at the inner, fixed screws for adjustment of the moment of turning on of the regulating organ. Such construction of the device assures production of a signal proportional to the average temperature of the body. 8.8.

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IVACHEV, I.M.
UR 0482

Soviet Inventions Illustrated, Section III Mechanical and General,
Derwent, 1-70.

243174 WINCH driven by electric motor built into the drum, with hand drive and planetary transmission, differing in the hand drive being mounted on the drum and connected via the planetary transmission to the electric motor. This simplifies the design and reduces dimensions. When motion is being transmitted from electric motor 3, eccentric shaft 4 rotates. Gear 6, running on fixed crown 7, imparts motion via its paired gear 5 to crown gear 2 and the drum. This first planetary stage of the hand transmission is idling, flywheel 8 does not rotate, since it is disengaged from clutch 10. When transmission of rotation is by the hand drive, flywheel 8 moves along the axis and engages with

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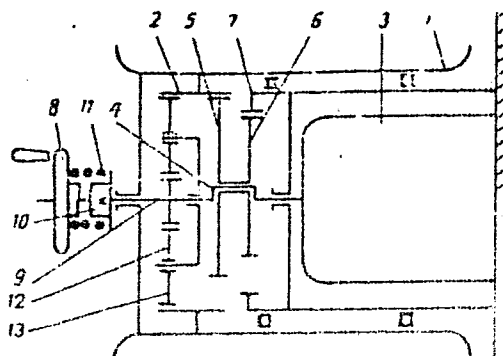
clutch 10. The moment is imparted from the clutch to shaft 9, sunwheel 12, satellites 13, which, running round the crown gear, impart motion to the pole connected to eccentric shaft 4. Then (as in motor drive) gear 6, running on the fixed gear, imparts motion via gear 5 (paired with gear 6) to crown gear 2 and the drum. Braking is by the self-braking planetary transmission with eccentric shaft.

29.7.64. as 914446/27-11, IVACHEV, L.M. (18.9.69)
Bul. 16/5.5.69 Class 35c, Int. Cl. B 66d.

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USSR

IVAKHNENKO, A. G., TOLOKHYANENKO, V. A., and YAREMENKO, A. G., Kiev

"Control with Optimization of Prediction with Discrete Linear Predicting Models of a Plant"

Kiev, Avtomatyka, Jan-Feb 74, pp 28-38

Abstract: As distinct from an article in issue #2, 1973, of this journal by Ivakhnenko and Toloknyanenko entitled "Control with Optimization of Prediction with Continuous Models of a Plant," this article considers systems with discrete, linear predicting models. Optimization is performed on a sliding prediction interval. Equations are obtained for the action of a closed system. The authors study the effect of the prediction time on the action and stability of closed-loop control systems with optimization of prediction. An asymptotic law is established according to which a decision taken at the current moment undergoes no changes with a further increase in the prediction time if the prediction time is sufficiently great. According to the principle of the Pontryagin maximum, optimal control is found which is possible with optimization of processes whose behavior can be predicted by means of linear Models.

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USSR

IVAKHNENKO, A. G., et al., Avtomatyka, Jan-Feb 74, pp 28-38

In the case of problems of large dimension and with nonlinear filters, one should apply the principle of self-organization ["Self-Organization of Recognition Systems and Automatic Control," Kiev, 1969, by a A. G. Ivakhnenko].

The article includes 17 equations and two figures. There are six references.

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USSR

IVAKHNENKO, A. G. and TOLOKNYANENKO, V. O. (Kiev)

"Control with Prediction Optimization in Simple, Continuous Models of a Plant"

Kiev, Avtomatyka; March-April 1973, pp 64-72

Abstract: A control system with prediction optimization responding to the basic principles of self-organization is investigated. A simple linear predicting model acting only in a local (limited) interval of time equal to the prediction time is applied to the system. Because of the simplicity of the model, the authors are able to apply the Pontryagin principle of the maximum to optimization and to clarify the basic properties of the above-mentioned system; in particular, to discover an asymptotic law according to which, with an increase in prediction time, optimal control varies less and less and stability of the control system increases (monotonically or with damping oscillations) to some steady-state value.

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IVAKHNENKO, A. G.

A METHOD OF MATHEMATICAL MODELING OF COMPLEX ECOLOGICAL SYSTEMS
 (Article by A. G. Ivakhnenko, Yu. V. Kozlov, M. N. Tolstov, and G. V. Petukhov; Kiev, Avtomatika, Krasnodar, No. 7, 1971, pp. 20-38)

JPRS 55818
 27 April 1972

UDC: 62-50.23

Problem Statement for Modeling of the Water Ecological System

Automatic control-computer centers will be created in the near future which will be equipped by means of telemetering systems with sensors operating on control elements of conditions in water reservoirs. Since water reservoirs will be objects of automatic control the mathematical modeling of the ecological system of water reservoirs becomes increasingly necessary.

An attempt is made below to apply to this purpose a new approach of an heuristic self-organization where instead of differential equations particular use is made of nonlinear equations of higher power in finite differences (a "potential description"). This approach is more adequate for simulation of problems of complicated processes and it is capable of producing not only qualitative but accurate estimates of variables.

Models which were constructed until present are applicable only to a qualitative investigation of processes as it is stated by the authors of these models. For example, in [2] where the best determined model has been described one can read: "Investigation results of the created model of the water ecosystem may be considered only from the qualitative standpoint, more work is necessary in order to obtain valid qualitative data." In contrast to this the authors of the present paper claim that their mathematical model produces in addition to qualitative also valid quantitative estimates.

Accuracy of Simulating Complicated Objects Requires Measured Complexity of Mathematical Description

There is a definite inconsistency between the complexity of mathematical simulation and the simplicity of the apparatus utilized for this purpose. Until present the simulation was performed either by determined methods (based on investigation of simple differential equation, for example, linear equations of convective diffusion), or statistical methods of ordinary regression

IVAKH NENKO, A. G.

cybernetics

PROBLEMS OF COMPLEX SYSTEM MODELING AND APPLIED MATHEMATICAL STATISTICS

(Article by A. G. Ivakhnenko and A. G. Ivakhnenko, Moscow, 1971, pp. 1-11)

Certain basic problems of modeling complex systems and applied mathematical statistics are being discussed. For the sake of brevity we shall not explain the relations ship between simple (deterministic and complex (stochastic) systems. This question has already been covered in many articles, and especially in Stafford Beer's excellent book [1]. We assume also that the reader knows the main and basic concepts of modeling complex systems and their applications. We shall not devote to this question the space and time that in other modeling of the model has been used to present a system of relations and equations for prediction of the future course of processes in a complex system. It gives sufficiently accurate qualitative indications of solutions of self-organization so do not develop a model to explain the structure of a complex system but as a means of using it to obtain accurate prognosis for the future.

If only short selections of data are presented, then the most accurate prognosis are given by models synthesized by the group method of deterministic arguments (GMD), with which, of course, the reader is familiar [2-4]. The algorithm for obtaining a prognosis is composed in two stages: first the model itself is composed by the GMD algorithm, then it is used to obtain an accurate prognosis.

Strength and Weakness of Modern Mathematical Statistics from the Practical Point of View

Only mathematical statistics, irrespective of all its internal conflicts (some of which will be discussed later).

USSR

UDC 62-50

IVAKHNEKO, A. G., KOPPA, Yu. V., and VU XUAN MINH, Kiev

"Polynomial and Logic Theories of Dynamic Systems. II"

Kiev, Avtomatyka, No 4, Jul-Aug 70, pp 17-41

Abstract: Continuing their discussion of the idea of constructing new polynomial and logic theories of dynamic systems for complex problems in place of existing theory based on the use of differential equations, the authors describe the elements of the polynomial theory of stochastic systems and consider the derivation of polynomial descriptions for stochastic components. An example is given of the derivation of polynomial descriptions of a stochastic system: viz., the dynamics of economic change in England for the last 15 years, and an algorithm is shown for the vector of optimal control with information storage, using the MDHG method. The characteristic vector used in the example is taken from the works of P. C. Parks and F. G. Pyatt. An algorithm is given for situation analysis for the 16th year (1969) and for situation forecasting for several years ahead. Forecasting formulas are used as a certain general description of a system, bypassing the stage of coefficient restoration and dynamic equation solution. Identification of differential dynamic equations is not

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USSR

IVAKHNENKO, O. G., et al, Avtomatyka, No 4, Jul-Aug 70, pp 17-41

necessary. The polynomial theory of dynamic systems requires less information about an object and hence is more suitable for complex control problems, especially in optimal control with information storage.

The authors thank I. K. Tymchenko and O. A. Golomoizina for their assistance in the calculations.

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UDC 62-50

IVAKHINENKO, ~~A~~ G., SPYNU, YE. I., DIMITROV, V. D., PATEREU, S. G.,
and PATRATY, I. Z. (Kiev, Sofia, Kishinev)

"Recognizing the Lethal Duration and Content of Pesticides in Plant
According to a Probability Algorithm for a Method of Data Handling by
Groups"

Kiev, Avtomatyka, No 5, Sep-Oct 70, pp 42-52

Abstract: The article describes the development of a probability al-
gorithm for a method of data handling by groups which uses the numerator
of the Bayes formula or its modification as a support function. The
probability algorithm is used to solve the following problem:

1) Approximately determining the time constant in the exponent
in the expression for a pesticide's toxicity on the basis of data con-
cerning the physicochemical properties of the preparation, the conditions
of its use, and plant peculiarities;

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IVAKHNENKO, O. G., et al., Avtomatyka, No 5, Sep-Oct 70, pp 42-52

2) Determining the current concentration of a pesticide at a given time from calculated data on the initial concentration of the substance in plants and the destruction rate constant.

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UNCLASSIFIED

PROCESSING DATE--20NOV70

TITLE--REGULARIZATION OF DECISION FUNCTIONS IN THE METHOD OF DATA HANDLING
BY GROUPS -U-

AUTHOR-(C2)-IVAKHNEKO, A.G., KJPPA, YU.V.

COUNTRY OF INFO--USSR

SOURCE--AVTOMATIKA, VOL. 15, MAR.-APR. 1970, P. 56-67

DATE PUBLISHED-----70

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ELECTRONICS AND ELECTRICAL ENGR.

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PROCESSING DATE--20NOV70

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ABSTRACT/EXTRACT--(U) GP-C- ABSTRACT. ANALYSIS OF TIKHONOV'S (1965) REGULARIZATION TECHNIQUES FOR OPTIMUM CONTROL PROBLEMS. TWO OF THESE TECHNIQUES ARE SHOWN TO BE PARTICULARLY WELL SUITED FOR USE IN POLYNOMIAL ALGORITHMS OF THE METHOD OF DATA HANDLING BY GROUPS. (1) AVAILABLE DATA (SET OF INTERPOLATION POINTS) ARE ARRANGED ACCORDING TO THE VARIANCE VALUES AND ARE DIVIDED INTO A TEACHING SEQUENCE AND AN APPROXIMATELY EQUAL CHECKING SEQUENCE. (2) USE IS MADE OF STANDARDIZED READINGS OF VARIABLES IN DEVIATIONS FROM THE CONSTANT OR MOVING AVERAGE. A METHOD OF ARTIFICIALLY INCREASING THE NUMBER OF INTERPOLATION POINTS FOR SMOOTH PLANTS IS PROPOSED. EACH OF THESE TECHNIQUES IS SHOWN TO PROVIDE A UNIQUE AND STABLE SOLUTION. THE USE OF THE TECHNIQUES IS DEMONSTRATED BY A PRACTICAL EXAMPLE.

UNCLASSIFIED

USSR

IVAKHNENKO, A. G.; OVCHINNIKOV, V. A.; PETRAKE, G.; GULYAN, N. V. (Kiev)

"Automatic Control of Complex Plants with Prediction Optimization by the Self-Organization Principle"

Kiev, Avtomatika; July-August 1973, pp 39-52

Abstract: In control with prediction optimization each solution is evaluated from the standpoint of its effect on predicting the future.

In this article the problem of the synthesis of optimal control was solved in discrete time. A plant (hydroelectric power station) for which optimal control may be found by means of both dynamic programming and the self-organization principle (selection) was taken as the first example. This made it possible to determine the dependence of the error of the exact solution on the choice of degree of freedom. For $F \geq 90$ both methods proved to give close results. In contrast to dynamic programming, the self-organization method is applicable to more complex plants with a greater amount of delaying independent variables and to optimization in a sliding interval of the prediction. A complex stochastic plant for which dynamic programming cannot be applied was taken as the second example.

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USSR

IVAKHNENKO, A. G., et al., Avtomatika; July-August, 1973, pp 39-52

The article includes 22 equations, seven figures, and five tables. There are nine bibliographic references.

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USSR

IVAKHNENKO, A. G., DIMITROV, V. D., GULYAN, N. V., IVAKHNENKO, L. N.

"Problems of Modeling of Complex Objects on the Basis of Heuristic Self-Organization"

Kiev, Kibernetika i Vychislitel'naya Tekhnika, No 13, 1972, pp 18-38.

Abstract: A number of trends in cybernetics concern the problem of modeling of complex objects. The authors show that in spite of the differences in initial assumptions, all of these trends can be reduced to the creation of very complex objects, the quality of which is determined by the extent to which they can "learn" rapidly: i.e., the extent to which they can "construct an internal model of an external situation." Models studied include the Kalman predicting filter, the Kalman filter, the perceptron, and neuron networks.

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